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ABSTRACT

A study investigated effects of comprehensive prenatal care on birthweight, child development, and maltreatment of children. A total of 2,585 pregnant women were screened at their first prenatal visits and the 428 at highest social risk were randomly assigned to either comprehensive intervention or routine prenatal care. The comprehensive intervention was designed to provide psychosocial support and comprehensive health care for low-income women and infants during the mother's pregnancy and the first 2 years of the child's life. This report describes effects of the intervention on birthweight. Multiple regression analysis that used medical and social predictor variables showed a strong relationship between the set of predictors and the criterion variable of birthweight. Analyses of variance for primiparous and multiparous mothers showed an effect of intervention on birthweight for primiparous but not multiparous mothers. There was a significant interaction between intervention and age group. Effects of the intervention were greater for 17- to 21-year-old mothers than for others. It is concluded that the study demonstrates favorable effects of comprehensive prenatal care and psychosocial support on birthweights of infants born to young and primiparous low-income women. (RH)

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Effect of Comprehensive Prenatal Care and Psychosocial Support on Birthweights of Infants of Low-Income Women

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Abstract

Correlational studies of pregnancy outcomes have implicated social and behavioral variables as having major effects on birthweight. In order to study the effects of a prenatal intervention using a prospective randomized design, we screened 2,585 pregnant women at their first prenatal visits at Metropolitan Nashville General Hospital, a public hospital serving the indigent population of Nashville. The 428 at highest social risk, as determined by a prenatal interview used in our longitudinal study of medical, social, and developmental outcomes, were randomly assigned to either comprehensive intervention ($\underline{N}$ = 217) or routine prenatal care ($\underline{N}$ = 211). The comprehensive intervention consisted of prenatal care provided by a multidisciplinary team of nurse-midwives, social workers, a nutritionist, paraprofessional home visitors, and a psychologist. Routine prenatal care consisted of standard medical care provided by the obstetrical residents of the hospital. Medical care provided in both services was supervised by the physicians of the hospital's Dept. of Obstetrics.

Multiple regression analysis using medical and social predictor variables showed a strong relationship between the set of predictors and the criterion variable of birthweight. Separate analyses of variance for primiparous and multiparous mothers using intervention group, race, and age group as between factors showed an effect of intervention on

birthweight for primiparous but not multiparous mothers. There was also a significant intervention x age group interaction, showing greater effects of the intervention on 17 to 21 year old mothers.

This study demonstrates favorable effects of comprehensive prenatal care and psychosocial support on birthweights of infants born to young and primparous low-income women.

Low birthweight plays a major role in infant mortality and morbidity. A variety of studies using varying non-experimental methods have implicated social and behavioral variables as having effects on birthweight (e.g., Committee to Study the Prevention of Low Birthweight, 1985). Factors such as smoking (Stein & Kline, 1983), alcohol consumption (Mills, Graubard, Harley, Rhoads, & Berendes, 1984), stress (Newton & Hunt, 1984), and failure to obtain prenatal health care (Murray & Bernfield, 1988) have been found to be related to birthweight outcomes. In addition, demographic characteristics such as maternal age, race, marital status, educational level, and socioeconomic status are well known as factors associated with birthweight.

Our search of the literature has revealed only one randomized study of the effects of broad-based prenatal intervention on birthweight. Olds, Henderson, Tatelbaum, and Chamberlin (1986) randomly assigned 354 primiparous women into experimental and control groups. The intervention included: nurse home visits to educate mothers about prenatal development and maternal health issues, smoking cessation, linkages with community services, enhancement of informal support networks, and emphasis on the pregnant women's personal strengths. Although overall effects on birthweight were not found, a subset of 21 teenage mothers who enrolled in the intervention before mid-gestation had infants with higher birthweights (3,437 gm) than did the 11 control mothers (2,922 gm). This difference was significant ($p < .001$) after

adjusting for pre-pregnancy height, weight, smoking, and gestational length. There are other randomized studies of the effects of specific interventions, primarily nutritional supplementation (Rush, Stein, & Susser, 1980) and smoking cessation (Sexton & Hebel, 1984) but Olds et al. is the only published test of a comprehensive approach.

We designed a study to test the effects of comprehensive prenatal care on birthweight, child development, and child maltreatment. This study had a prospective design with random assignment of participants to intervention and control groups. The intervention was designed to provide psychosocial support and comprehensive health care for low-income women during pregnancy and for the women and their infants for two years after birth. This report describes the effects of the intervention on birthweight.

Method

We screened 2,585 pregnant women at their first prenatal visits at Metropolitan Nashville General Hospital, a public hospital serving the indigent population of Nashville. Of these women, 1,170 qualified for the study by being less than 28 weeks gestation and consenting to random assignment to one of two prenatal services at the hospital. The 428 at highest social risk, as determined by the second edition of the Maternal History Interview (Altemeier, O'Connor, Vietze, Sandler, & Sherrod, 1982), were randomly assigned to either

the intervention (N = 217) or routine prenatal care group (N = 211).

The intervention group received comprehensive prenatal care provided by a multidisciplinary team of nurse-midwives, social workers, a nutritionist, paraprofessional home visitors, and a psychologist. This team focused on psychosocial support for the mothers, education about self care, and promotion of healthy behaviors during pregnancy (good nutrition, avoidance of alcohol and drugs, and reduction of smoking). Any participant who missed an appointment was followed up with phone calls, mailings, and, in some cases, home visits to encourage her return to prenatal care. The intervention group mothers had individual meetings with the psychologist from time of entry into the intervention until approximately 28 weeks gestation when they began prenatal support groups led by the psychologist. The prenatal groups emphasized support to the mothers as well as promotion of healthy prenatal behavior and preparation for childbirth.

Routine prenatal care consisted of standard medical services provided by the obstetrical residents of the hospital in an outpatient prenatal clinic. The medical care provided in both services was supervised by the attending physicians of the hospital's Dept. of Obstetrics. Deliveries for both the intervention and routine care group were in the hospital's labor and delivery area (except for a

subset of mothers who elected to deliver at other hospitals). The pregnant women, health care providers, and data collectors were blind to the design and hypotheses of the study.

Outcome data were obtained by recording birthweights to the nearest 10 grams at delivery for all participants who were born at the study hospital and by obtaining medical records for as many as possible of those who delivered elsewhere. Other data were obtained by review of mothers' and infants' medical records by two research assistants who maintained inter-rater reliability of .90 or greater in use of a coding system for abstracting perinatal data. The perinatal data set included demographic risk factors for low birthweight (age, race, marital status, education), maternal health behaviors (smoking, drug and alcohol use), health-related conditions prior to pregnancy, and obstetrical histories from prior and current pregnancies. For the analyses reported here, only singleton births are included.

Results

Table 1 compares the demographic characteristics of the intervention and routine care groups. Slightly more of the women in the intervention group were black, and slightly more were single, but the only significant difference ($p < .05$) was that intervention mothers averaged one year younger.

Multiple regression analysis was used to predict birthweight in the 289 cases (intervention N = 166, routine care N = 123) for which complete prenatal and perinatal data were available. This analysis demonstrated a significant relationship between the set of predictors and birthweight ($R2$ = .35, $F(25, 263) = 5.69$, $p < .0001$). As illustrated in Table 2, birthweight was associated with maternal pregravid weight ($p < .0001$), smoking ($p < .05$), labor and delivery complications ($p < .05$), weight gain during pregnancy ($p < .005$), sex of the infant ($p < .01$), age at first delivery ($p < .05$), and maternal history of prior low birthweight deliveries ($p < .01$). In this overall regression analysis, the intervention was not significantly predictive of birthweight.

Multiple regression was used in separate analyses for primiparous mothers (intervention N = 81, routine care N = 56) and multiparous mothers (intervention N = 85, routine care N = 67). For primips, the regression equation was significant ($R2$ = .41, $F(20, 116) = 3.98$, $p < .0001$) with the following variables showing significant unique contributions to the prediction: intervention ($p < .02$),

weight gain during pregnancy ($p < .001$), maternal height ($p < .05$), complications of pregnancy ($p < .001$), and pregravid weight ($p < .01$). For multips, the regression was also significant ($R2 = .45$, $F(25, 126) = 4.11$, $p < .0001$) with specific contributions by the following variables: pregravid weight ($p < .0001$), male sex of the infant ($p < .01$), smoking ($p < .02$), maternal history of prior low birthweight births ($p < .01$), and race ($p < .001$). Results of the regression analyses are summarized in Table 2.

Birthweights of the 184 intervention and 163 control participants for whom birthweight was obtained (whether or not the complete perinatal data set was available) were examined with analysis of variance using intervention group, race, and age groupings ($\leq$ 16, 17-18, 19-21, and 22+) as between factors. This analysis revealed no significant main effects but one significant two-way interaction, intervention x age group. ($F(3, 327) = 3.70$, $p < .02$). Post hoc analysis of this interaction showed a greater effect of intervention for the 17-18 year olds ($p < .05$) and 19-21 year olds ($p < .10$).

A similar ANOVA was performed involving only the primiparous mothers (intervention $N = 86$, control $N = 75$). This analysis showed a main effect for intervention ($F(1, 146) = 4.50$, $p < .05$). The intervention x age group interaction was also significant ($F(3, 146) = 2.80$, $p < .05$). A similar ANOVA with only multiparous mothers

(intervention N = 97, control N = 88) showed no significant main effects or interactions.

Discussion

This study demonstrates favorable effects of comprehensive prenatal care and psychosocial support on birthweights of infants born to young and primiparous low-income women. This finding is in keeping with the study by Olds et al. who restricted their sample to primiparous mothers and found effects on birthweight only among a teenaged subsample. Attempts to change prenatal behavior and to provide psychosocial support seem more likely to be effective with primiparous mothers because they are experiencing pregnancy for the first time and intervention does not face the obstacle of established patterns of maternal behavior.

Further study is needed to specify the mechanisms by which comprehensive prenatal care, as compared to routine prenatal medical care, leads to improved birthweight outcomes for young primiparous women. Also worthy of study is whether improvement in outcome of the first pregnancy has favorable effects on the outcomes of subsequent pregnancies.

References

Altemeier, W.A., O'Connor, S.M., Vietze, P.M., Sandler, H.M., and Sherrod, K.B. (1982). Antecedents of child abuse. Journal of Pediatrics, 100, 823-829.

Committee to Study the Prevention of Low Birthweight. (1985). Preventing low birthweight. National Academy Press: Washington, D.C.

Mills, J.L., Graubard, B.I., Harley, E.E., Rhoads, G.G. and Berendes, H.W. (1984). Maternal alcohol consumption and birthweight: How much drinking during pregnancy is safe? Journal of the American Medical Association, 252, 1875-1879.

Murray, J.L., and Bernfield, M. (1988). The differential effect of prenatal care on the incidence of low birth weight among blacks and whites in a prepaid health care plan. New England Journal of Medicine, 319, 1385-1391.

Newton, R.W., and Hunt, L.P. (1984). Psychosocial stress in pregnancy and its relation to low birth weight. British Medical Journal, 288, 1191-1194.

Olds, D.L., Henderson, C.R., Tatelbaum, R., and Chamberlin, R. (1986). Improving the delivery of prenatal care and outcomes of pregnancy: A randomized trial of nurse home visitation. Pediatrics, 77, 16-28.

Rush, D., Stein, Z., and Susser, M. (1980). A randomized controlled trial of prenatal nutritional supplememtation in New York City. Pediatrics, 65, 683-697.

Sexton, M., and Hebel, J.R. (1984). A clinical trial of change in maternal smoking and its effects on birth weight. Journal of the American Medical Association, 251, 911-915.

Stein, Z., and Kline, J. (1983). Smoking, alcohol, and reproduction. American Journal of Public Health, 73, 1154-1156.

Table 1

Demographic Characteristics

	Intervention Care Group	Routine Care Group
Mean Age at Delivery	21.76*	22.84*
Mean Educational Level	10.68	10.81
Mean Number of Pregnancies (includes current pregnancy)	2.31	2.50
Mean Number of Previous Live Births	.86	.94
Racial Composition (Percent Black)	35.87	30.06
Marital Status (Percent Single)	59.24	53.99

* Difference between groups is significant at $p < .05$ level

Table 2

Summary of Regression Analyses

Predictor Variables	Beta Values		
Demographic Characteristics	All	Prim	Mult
Maternal Age	.00	.02	.02
Maternal Race	.25***	.09	.31***
Marital Status	.03	.00	.06
Maternal Education	.10	.08	.10
Maternal Pregravid Medical Problems			
Obstetrical History--Prior Pregnancies			
Number of Unsucessful Pregnancies	.06	.17	.03
Number of Previous Premature Births	.11	NA	.10
Number of Children ≤ 18 Months of Age	.11		.11
Number of Children > 18 Months of Age	.62		.68
History of Obstetrical Problems During Prior Pregnancies	.02		.06
History of Prior Low Weight Births	.19**		.23**
Maternal Age at First Delivery	.15*	.13	.14

Table 2 (Continued)

Obstetrical History--Current Pregnancy			
Pregravid Weight	.43***	.29**	.51***
Weight Gain During Pregnancy	.16**	.27***	.11
Labor and Delivery Complications	.11*	.01	.13
Male Sex of Infant	.15**	.12	.22**
Parity	.74		.66
History of Sexually Transmitted Diseases	.01	.03	.05
Maternal Height	.05	.20*	.04
Kessner Index of Adequacy of Care	.06	.06	.03
Complications of Pregnancy	.09	.29***	.02
Maternal Health Behaviors			
Drug and Alcohol Use	.03	.06	.02
Cigarette Smoking	.12*	.01	.20*
Social Complications of Pregnancy	.10	.05	.13
Intervention	.05	.20*	.08

Significance levels : * $p < .05$

** $p < .01$

*** $p < .001$

Table 3

Mean Birthweights for Intervention and Routine Care Group by Age

All Mothers

	Age Groups			
	≤ 16	17-18	19-21	22+
Intervention	2978	3385	3371	3168
Routine Care	2854	3003	3184	3217

Primiparous Mothers

	Age Groups			
	≤ 16	17-18	19-21	22+
Intervention	3000	3360	3328	3209
Routine Care	2866	2910	3120	3054

Multiparous Mothers

	Age Groups			
	≤ 16	17-18	19-21	22+
Intervention	2551	3441	3421	3152
Routine Care	2750	3533	3283	3199